A REVIEW OF GOVERNMENT POLICIES ON FORESTRY AND THEIR INFLUENCE ON THE TIMBER INDUSTRY IN PAHANG

by

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INTRODUCTION

The timber industry is in many ways the most important for the State of Pahang. This is not surprising as a very large portion of the State's land area, approximately 12,000 square miles out of its total area of 13,873 square miles is forested. Out of this 5,000 square miles have been set aside as permanent forest estate. In terms of its contribution to the total outturn of timber from the States of West Malaysia Pahang's share has risen from 22% in 1957 to about 74% in 1970.

(A) Objective and Scope of Study

Because of its importance to the State's economy the writer has been interested in the factors that affect and influence the industry. It is submitted that government policies particularly those directed to forestry and the timber industry is one of the most important factors. Thus the study is aimed at reviewing government's policies towards the timber industry which control and influence the growth of and the trends in the timber industry in Pahang. The study attempts to examine the extent of this control and influence and to identify areas where this can be exercised to maximise the benefits that would accrue to the State and the nation.

The study is limited to the geographical area of the State of Pahang only although some reference to developments

outside the State is inevitable where these have a bearing on the industry in Pahang.

For the purpose of this study the writer classified the industry into three stages which for lack of better terminology he calls (i) the primary stage, (ii) the secondary stage and (iii) the tertiary stage. The division is as follows:

(i) Primary Stage: consists of the process of felling standing timber and the process of transporting felled timber to collecting points for transport to processing centres or for transportation to ports of embarkation for export.

(ii) Secondary Stage: the stage in which timber or round logs are processed into planks, posts, scantlings, collectively known as sawn timber or plywood or veneer. The product after this stage is semi-finished and form the raw material for the next stage.

(iii) Tertiary Stage: is the processing of sawn timber and/or plywood or veneer into finished products.

The study is almost wholly confined to the primary and secondary stages only as these are the most developed and the most susceptible and responsive to government policies. The tertiary stage is only mentioned in passing as these are not strictly controlled and influenced by policies directed towards the timber industry as such but more influenced by the general policies on industrialization and therefore outside the scope of this study.

(B) Research Methodology

Most of the information on government policies on the timber industry is unpublished. Indeed some of them consists only of directives to the State Forest Officer. Thus research on this aspect of the paper was confined to the records and files in the State Forest Department and the State Secretariat in Kuantan and the Federal Forest Headquarters in Kuala Lumpur. In carrying out this research the fact that the writer had served in Pahang, first as Private Secretary to the Menteri Besar and then as Assistant State Secretary covering a period of five years, was invaluable. It gave the writer the opportunity to become acquainted with officers in the State Forest Department, some of whom were later promoted and are now holding key positions in the Federal Forest Headquarters, with some loggers and sawmillers and as Private Secretary to the Menteri Besar with some of the problems faced by the elected Chief Executive of the State with regard to forestry.

Through the cooperation of officers in the State Forest Department the writer was able to examine the records and files and through their further indulgence and the indulgence of officers in the Federal Forest Headquarters the writer was given interviews, discussions and suggestions.

Another major source of information are the published reports of the Federal Forest Headquarters and the published reports of the State Forest Department. However, these had to be updated in respect of data for 1970 as the latest published report at the time of writing are those of 1969.

Apart from the above mentioned sources the writer also drew from his own knowledge of certain aspects of the industry gathered over the years he served in Pahang through informal contact with those in the timber industry.

(C) Limitations

Lest the foregoing comments give the impression that the writer face no difficulty in obtaining material for this study some mention of the limitations and constraints to the study is in order. Although the writer was given full cooperation by all concerned this does not mean he could obtain all the data required to make the study deeper and more comprehensive e.g. data on the tertiary timber industry is very scanty and incomplete. So also are data on the number of people employed in logging operations and in the transportation of timber. Information on the rationale and arguments for some of the important decisions taken are also not available and is believed to be known only to those who make the decisions in the State Executive Council.

(D) Organization of Chapters

This paper is divided into four main parts. Chapter I forms the first part and deals with the administrative and legal framework which discusses the various constitutional provisions, the Interim National Forest Policy and the various rulings and decisions made by the State Government regarding the timber industry. The second part consists of Chapters II and III. Chapter II deals with the sources of raw material for the timber industry and here attempts are made at forecasting, the volume

and flow of timber from Pahang's forests. Chapter III also deals with the sources of timber but from the conservation and protection of forests point of view. The third part of the paper consists of only one chapter - Chapter IV on the processing of timber in the State, the State of the Secondary timber industry in the State and its contribution to the job market. Chapter V is on a subject which is not peculiar to the timber industry alone but of late covers every industry - the governments policy on Bumiputra participation in industry. But here discussion is confined to Bumiputra participation in the timber industry in Pahang.

(E) Acknowledgements

The writer wishes to record here his gratitude to senior officers in the Federal Forest Headquarters and in the State Forest Department for the unreserved support and cooperation given to him during his research. The writer feels that without this support and cooperation it would have been impossible for him to obtain information on government policies. A word of thanks is also due to those loggers, sawmillers and executives in the larger sawmills who have given some of their time to talk to the writer on their business when the writer called on them in August 1971.

The writer wishes to reserve a special word of thanks to Mrs. M. Puthucheary who supervised the writing of this paper. Her guidance on the organization of the paper and her searching questions had helped to sharpen analysis of the information and data collected.

CHAPTER I

GOVERNMENT POLICIES ON FORESTRY AND FOREST MANAGEMENT

(A) The Administrative and Legal Framework

In the distribution of legislative powers stipulated in the Federal Constitution forestry is a state subject within the State List.[1] But Article 76 (1) (b) gives the power to Parliament to make laws with respect to any matter enumerated in the State List for the purpose of promoting uniformity of the laws of two or more States. More specifically Clause (i) of Article 94 of the Federal Constitution provides inter alia "the agricultural and forestry officers of any State shall accept any professional advice given to the Government of that State under this Clause".

2. Within the above-mentioned constitutional framework the Department of Forestry is organised as the Division of Forestry in the Ministry of Agriculture and Land. It consist of the Federal Forest Headquarters, the Timber Utilization and Engineering Branch, the Forest Research Institute and the State Forest Department in each State.

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[1] Malaysia - Federal Constitution - Article 74 and Ninth Schedule.

3. The Federal Forest Headquarters is headed by the Director of Forestry who is aided by his Deputy and Assistant Directors; the Timber Utilization Branch which is headed by the Conservator of Forest Utilization and Development; and the Forest Research Institute by the Chief Research Officers. In each State there is constituted a State Forest Department whose senior officers, the State Forest Officers, the Silvicultural Officers, The District Forest Officers and the Assistant District Forest Officers are seconded to the States from the Federal Forest Headquarters. Other members of State Forest Department are State officers.

4. For the purpose of forest administration the State of Pahang is divided into six administrative districts each under the charge of a District Forest Officer, more commonly known by the abbreviated form of their designations as DFO's. The DFO's receive applications for logging areas, process the applications, investigate the area applied for and forward the application for the consideration of the State Executive Council through the State Forest Officer. Once an application is approved by the Executive Council the DFO's issue felling permits, over parts of the area in annual instalments, if the area is in Forest Reserve, the number of which depends on the duration the area is supposed to be felled following the Working Plan[2] for the State.

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[2]Working Plan is the plan for the felling of forests in Forest Reserves following the 70-year cycle.

5. The law that is applied in the administration of the timber industry in the State is the Pahang (Forest) Enactment No. 6 of 1934 and rules made under the authority of that law.

(B) The Pahang (Forest) Enactment No. 6 of 1934

6. Enactment No. 6 of 1934[3] was passed by the Pahang State Legislative Council on 24th September, 1934 and was published in February 28th, 1935 issue of the Federated Malay States Gazette. Amongst other things the Enactment:

(i) gives power to the State Authority to appoint officers to administer the States forest resources.

(ii) gives powers to officers so appointed.

(iii) empowers the State Authority to Constitute Forest Reserves.

(iv) empowers the State Authority to make rules and establish procedures for the removal of forest produce from Forest Reserves, State Land, other reserved land and from alienated land.

(v) gives powers to the State Authority to impose premiums and royalties for the removal of forest produce and fines for offences against the Enactment.

(C) The Interim National Forest Policy

7. At present there is no national policy on forestry. Each state has its own Forest Enactments to control the extraction of forest produce. In 1968 an Interim National Forest Policy was

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[3] Enactment (Pahang) No. 6 of 1934.

adopted by the National Land Council which in turn recommended it for adoption by the States of West Malaysia. All the States have since adopted this policy. As its name suggests the policy is only an interim measure and is meant to provide a basis for a National Forest Policy. In the preamble to the policy it was declared that whatever Forest Policy is adopted by the States of West Malaysia it must be radically influenced by and be consistent with the three considerations:[4]

(i) the uneven development of the country has led to a condition in which States are and will remain dependent on other States for supplies of forest produce.

(ii) that because the Forest Policy for West Malaysia is an integration of the policies of the individual states which comprise it, any departure from accepted principles on the part of any State Government must affect the others.

(iii) the attainment of supply in perpetuity of timber and other produce for West Malaysia must be viewed and planned from a Federal stand-point.

8. In line with the above considerations the Federal Government and the several State Governments of the States of West Malaysia agreed to adopt the proposed Interim National Forest Policy which contains the following objectives:[5]

(i) To dedicate to permanent forest for all time a portion of the forest lands of the country sufficient:

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[4] The Interim National Forest Policy.

[5] Ibid.

(a) to ensure the sound climatic and physical condition of the country, the safeguarding of water supplies, and soil fertility and the prevention of damage by flooding and erosion to rivers and padi fields and other agricultural land; such forest lands being known as Protective Reserves.

(b) for the supply in perpetuity at reasonable rates of all forms of forest produce which can be economically produced within the country and required for agricultural, domestic and industrial purposes, and for exports; such forest lands being known as Productive Reserves.

(c) to ensure adequate sites for continuing forest research.

(ii) To manage the Forest Estate with the object of obtaining the highest possible revenue compatible with the principle of sustained yield, and with the primary objects as set out above. For successful management, long-term planning and security of tenure are essential.

(iii) To promote thorough and economical utilization of forest produce on land not included in the Forest Estate.

(iv) To foster, by education and publicity a proper understanding among the people of the value of forest to them and their descendents.

9. In practical terms these policy objectives mean that the following steps would be taken by the States:

(i) To achieve objective (i) in paragraph 8 above the state would

(a) determine the acreage to be dedicated to permanent forest estate taking into consideration

the topographical feature of the land surface, the fertility of the soil, the demand for agricultural land by the present and future population of the State. In this the State is aided by the Federal Government's Land Capability Classification Survey undertaken by a groups of experts under the aegis of the Economic Planning Unit.

(b) once this is determined the areas to be designated permanent forest estate should be located with the guide of the Land Capability Classification Survey. Land that is suitable for agriculture would not be included in the proposed permanent forest estate.

(c) once this is finalised the acreage available for extraction annually would then be determined.

(ii) What was done to achieve the first objective would help to achieve the second. Once the permanent forest estate is gazetted and the State is committed to the idea of the management of forest on a sustained yield basis security of tenure would be a matter that can be taken for granted. However to obtain the highest possible revenue the method of allocating forest areas would have to be examined to determine whether areas should be allocated by negotiation, application or by tender. Then the matter of the intensity of extraction would have to be looked into.

10. By the end of 1970 the State Government of Pahang had decided that 5,000 square miles of forests in the State be dedicated to permanent forest estate. This represents 38% of the total land area of the State which is 13,873 square miles in area.

The proposed permanent forest estate had been demarcated and identified with reference to the report of the Technical Sub-Committee of the Land Capability Classification. Sixty per cent of the proposed permanent forest estate is estimated to be productive. In acreage productive Forest Reserve would approximate 1.92 million acres. Once the proposal is approved and gazetted it would mean that Pahang would be able to allocate approximately 27,430 acres from its Productive Forest Reserves for timber extraction annually in perpetuity if regeneration of worked areas are undertaken faithfully according to plan.

11. Regarding forests on State Land that is land that is not reserved for any purpose, the Interim National Forest Policy stipulates that they should only be exploited:

(i) subject to conditions similar to those imposed for forest estate, and

(ii) only immediately prior to alienation; or

(iii) as may be necessary to supplement production from productive forest estate if even the full annual coupe in the latter is in the opinion of the State Forest Officer, insufficient to supply the requirements of the State for internal use; or

(iv) if the Minister of National and Rural Development and the State Government are satisfied that the area is required for the purpose of carrying out development projects or the exploitation of natural resources other than timber.

12. To ensure that there will be no excess capacity of wood processing mills and thus build up pressure for the release of more areas for extraction than is compatible with the sustained yield principle the Interim National Forest Policy stipulates that the total capacity of wood processing mills should not exceed the productive capacity of the forests that are available as sources of supply.

13. On the matter of financing silviculture and other works of improvement the policy stipulates that for this to be more effectively implemented the Federal Government will assume responsibility for financing all approved schemes of the States on the basis of a levy to be imposed on the industry at a rate to be determined after consultation with the State Governments.

(D) The State Forest Policy

14. At the beginning of 1971 the State Government made certain policy decisions on the administration and management of the State's forest resources. These policy decisions translate into practical terms the policy objectives of the Interim National Forest Policy. The following is an extract[6] of the decision made on the allocation of State Land Forests and parts of Forest Reserves which had been recommended for excission by the Land Capability Classification Survey:

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[6] Source: State Forest Department Files.

(i) Procedure

(a) The Forest Department shall demarcate the exact areas actually required for agricultural development.

(b) The State Forest Department shall further determine the dates when work on agricultural development is to start and allocate the forest areas for extraction accordingly.

(ii) Method of Allocation

(a) Forested land shall be tendered out in blocks of 1,000, 2,000 and 3,000 acres in two categories:

- limited tenders open to Bumiputras or Bumiputra firms only
- tenders open to all.

(b) For areas of more than 1,000 acres the successful tenderer shall be subject to the following conditions:

- 75% of the outturn shall be processed within the State
- the areas shall be worked strictly according to Development Phase stipulated in an agreement to be entered into by the tenderer and the State Government.

15. For the working of Productive Forest Reserves the State Policy lays down the following:

(i) Procedure

The State Forest Department shall determine the areas to be worked, the acreage, and the duration according to the sustained yield principle.

(ii) Method of Allocation

(a) Any part of Forest Reserve which had been determined as fit for exploitation shall be allocated as follows:

- to Bumiputra firms
- to wood processing mills in that State which use modern and efficient machinery.

(b) Successful Bumiputra tenderers shall be subject to

- the area shall be worked according to an agreement to be entered into between the tendered and the State Government
- the area shall be worked by the tenderer himself and by no others. Lease or mortgage of the area is prohibited
- the area shall be worked in phases to be determined by the State Forest Officer
- any Bumiputra firm which has been allocated 8,000 acres or more shall be required to build a sawmill of not less than 3 bench-saw and one breakdown saw capacity. The sawmill can be constructed in phases
- no less than 50% of the workers employed shall be Bumiputra.

(c) Sawmill or Plywood/Veneer mill owners who are successful tenderers shall be subject to the following conditions:

- the area shall be worked according to an agreement to be entered into by the successful tenderer and the State Government
- 75% of the total outturn shall be processed in the State
- the acreage to be felled each year shall be determined by the State Forest Officer
- 50% of the employees in all grades shall be Bumiputra.

16. The foregoing policy decisions of the State Government are in fact not new. They merely reaffirm in more positive and specific terms policies which had been in use since 1966. It is too early to say whether these policies can be strictly adhered to. But judging from the positiveness of the assertions and the specific nature of the decisions one can reasonably expect them to be adhered to.

CHAPTER II

SOURCES OF TIMBER AND THE RATE AND FLOW OF OUTTURN

The term timber industry used here is a very general term to mean the industries that are based on wood. It can be classified according to the amount of processing into what I shall call primary, secondary and tertiary stages. The industries that fall into these stages are:

Primary

> This stage consists of felling the standing timber in the forest and bringing them to collecting points near a road, railway or river to be transported to processing mills. This stage is commonly known as logging.

Secondary

> This stage covers saw-milling, plywood and veneer making, chipping or pulp making.

Tertiary

> The conversion of sawn timber, plywood, veneer, chips or pulp into finished or semi-finished products as when sawn timber is manufactured into furniture, furniture-parts for assembly, mouldings, or when pulp is manufactured into paper.

2. At present the Pahang timber industry consists mainly of logging, some sawmilling and plywood and veneer manufacturing. The only tertiary wood-based industry in Pahang is some manufacturing of low grade furniture to cater for a portion of the local demand.

By far logging is the most important not only when compared to the other stages of the timber industry but also when compared to other industries.

(A) Sources of Timber

3. As has been stated earlier Pahang is the leading state in West Malaysia as far as the timber industry, particularly where logging is concerned. The industry is based on a number of sources of supply namely:

(i) Productive Forest Reserve.

(ii) Forests on State Land; two categories:

(a) Virgin forests on State Land

(b) Worked forests on State Land.

(iii) Neighbouring States of Kelantan, Trengganu and Johore.

4. The volume, the flow and the factors that affect the flow of supply from these different sources are somewhat different. Supply from Forest Reserves are in the main controlled, at least in theory, by predetermined permissible annual cut while those from State Land by many factors such as the requirements of agricultural development, necessity to supplement supply from Forest Reserves when the demand is high and to some extent other economic and political factors. I shall therefore treat these sources of timber separately.

(i) Productive Forest Reserves

5. In theory the supply of timber from this source is limited by the principle of sustained yield to the permissible annual cut

which is 1/70th of the total area of Productive Forest Reserve. This principle is based on the fact that the Malayan Dieterocarp species have a life cycle of 50 to 70 years. Therefore if any given area of forested land is harvested at the rate of 1/70th of the total area annually and no more and the felled areas are rehabilitated that area can go on supplying timber perpetually.

6. Until the end of 1970 the permissible annual cut from Pahang's Forest Reserves was 23,600 acres. With the enlargement of the Forest Reserves mentioned in paragraph 10 of Chapter I the permissible annual cut has been increased to 27,430 acres. At the rate of extraction of 15 cubic tons (1 cubic ton = 50 cubic feet) per acre the maximum supply that can be obtained from this source would be approximately 411,450 cubic tons per annum.

(ii) Forests on State Land

7. It is estimated that there are, at the beginning of 1971, 2.2 million acres of State Land with virgin forests and approximately 220,000 acres of worked forests on State Land which still contain marketable timber.

8. Virgin forest on State Land can be divided into the following categories:

(i) Areas which had been excised or earmarked for excision for specific development projects viz. the Jengka Triangle Integrated Land Development Project, and the Pahang Tenggara Integrated Land Development Project. (These areas have not been included in the calculation the acreage of the proposed Permanent Forest Estate in paragraph 10 of Chapter I).

(ii) Other State Land which had not been earmarked for specific development projects but which had been classified as agriculturally suitable by the Land Capability Classification Survey and these forests are expected to be felled to give way to agriculture sooner or later.

(iii) Large areas of State Land which had been alienated for large-scale agricultural development by the private sector.

9. It is difficult to make a good estimate of how long the areas under category (ii) above will last as a source of supply of timber as it is not known at what rate these areas will be worked. This rate depends very much on the demand for new agricultural land, the speed at which application for land can be processed and most of all on the speed in which land development authorities or statutory bodies charged with land development can open up new land for agriculture. However, given present prices and strength of demand it seems reasonable to expect that these areas will be worked over a period of ten years. The areas under the two integrated area development projects of Jengka Triangle and Pahang Tenggara will be felled according to the Schedule of development of the projects. An integrated timber processing mill has been built for the Jengka Triangle Project and a similar mill is being built for Pahang Tenggara. The former is expected to be completely worked by 1980 and the latter by 1990. Those areas under category (iii) above total about 200,000 acres and have been exploited since 1968 at the rate of about 1/5 of the total area annually and therefore the balance left is not substantial.

(iii) "Import" From Neighbouring States

10. For the present Pahang produces more than enough timber to supply wood processing mills in the State. However, some sawmills in the Districts of Kuantan and Kuala Lipis find it more profitable to import certain species of timber from Trengganu and Kelantan respectively. This is due to the proximity of the mills to logging areas in these two States. In 1968 for example a total of 43,000 cubic tons of round logs were "imported" from Trengganu and 850 cubic tons from Kelantan. Compared to Pahang's own production these figures are negligible.

(B) Rate of Exploitation of Forests

11. Since 1964 the rate of exploitation of Pahang's forest resources has increased tremendously and so has outturn. The acreage exploited in 1970 is just over twice that exploited in 1964 but the total outturn in 1970 is five times the total outturn in 1964. This shows that the average yield per acre has increased from 3.3 cubic tons per acre in 1964 to 8.6 cubic tons in 1970.

12. The average yield per acre figures are only averages and suffer from shortcomings of all averages. The outturn comes from the three categories of forests outlined above. They do not reflect the true yield per acre of the various categories of forests. In the following tabulation I have attempted to separate these figures and present the average yield by category of forests. The estimate is a very rough one but are based on implied facts in official records and from interviews of a few logging contractors.

Source \ Year	1964	1965	1966	1967	1968	1969	1970
Forest Reserves	16,837	37,092	22,064	30,126	45,308	50,800	50,136
Virgin Forest on State Land	48,146	34,747	149,376	52,373	118,326	124,439	78,491
Worked Forest on State Land	132,820	165,173	64,485	77,763	46,922	219,812	272,250
Total Acreage Worked	197,803	237,012	235,925	160,262	210,556	395,051	400,877
Average Yield/Acre (Tons)	3.3	3.1	4.9	8.6	8.7	5.3	8.6
Yield/Acre by Category*							
Forest Reserve	6	7	6	12	10.5	10	17
State Land (Virgin)	6	7	6	12	10.5	10	17
State Land (Worked)	2	2	2	4	2	2	5

Source: Data Compiled from State Forest Department's Annual Report.

*Estimates by writer.

TABLE 2.1

ACREAGE OF FOREST WORKED IN PAHANG 1964-70*

13. It is estimated that the acreage of forest that would be opened for exploitation would remain above the 200,000 acre mark until 1990. After that the main source of supply would be the annual coupe of 27,000 acres from the Permanent Forest Estate. This of course assumes that strict conservation is not exercised on the State Land forest as at present.

The above figures are derived from the following computation:

	Source	Acreage Per Year	Period Supply Supply Available
(i)	Productive Forest Reserve 1/70 x 1,920,000 acres	27,000	Perpetually
(ii)	State Land Virgin forests (excluding areas under Jengka Triangle and Pahang Tenggara Projects) 2,200,000 estimated to be exploited at about 5% per annum beginning 1971	110,000	1971-1990
(iii)	Jengka Triangle - there are approximately 100,000 acres to be cleared over the next 10 years 1971-80	10,000	1971-1980
(iv)	Pahang Tenggara - it is estimated that the acre contains about 1.5 million acres of virgin forest. According to the schedule of development this would have to be cleared in 20 years beginning 1971	75,000	1971-1990

Year	Forest Reserve	State Land	Jengka Triangle	Pahang Tenggara	Total Acreage	Total Outturn (cu.tons)
1971	27,430	110,000	10,000	75,000	222,430	3,336,450
1972	27,430	110,000	10,000	75,000	222,430	3,336,450
1973	27,430	110,000	10,000	75,000	222,430	3,336,450
1974	27,430	110,000	10,000	75,000	222,430	3,336,450
1975	27,430	110,000	10,000	75,000	222,430	3,336,450
1976	27,430	110,000	10,000	75,000	222,430	3,336,450
1977	27,430	110,000	10,000	75,000	222,430	3,336,450
1978	27,430	110,000	10,000	75,000	222,430	3,336,450
1979	27,430	110,000	10,000	75,000	222,430	3,336,450
1980	27,430	110,000	10,000	75,000	222,430	3,336,450
1981	27,430	110,000	-	75,000	212,430	3,186,450
1982	27,430	110,000	-	75,000	212,430	3,186,450
1983	27,430	110,000	-	75,000	212,430	3,186,450
1984	27,430	110,000	-	75,000	212,430	3,186,450
1985	27,430	110,000	-	75,000	212,430	3,186,450
1986	27,430	110,000	-	75,000	212,430	3,186,450
1987	27,430	110,000	-	75,000	212,430	3,186,450
1988	27,430	110,000	-	75,000	212,430	3,186,450
1989	27,430	110,000	-	75,000	212,430	3,186,450
1990	27,430	110,000	-	75,000	212,430	3,186,450
1991	27,430	-	-	-	27,430	411,450

TABLE 2.2

ESTIMATED ACREAGE OF FOREST THAT WOULD BE FELLED IN PAHANG 1971-91

14. From the above table it can be seen that the supply of timber from Pahang would drop sharply after 1990. While the felling of areas under the land development projects are already scheduled on considerations other than forest management the other areas are not similarly committed. There is therefore scope for debate whether these areas should be opened at the present rate. Many things can be said for continuing this policy. The first argument for continuing this rate of felling is that prices of timber despite the recession early this year are still very high and so why not make hay while the sun shines. Secondly, since demand for timber is now good it is better to harvest the forest now rather than keep them to a later period when a synthetic competitor might be discovered. Thirdly, it can be argued that since the government need the money for development now it is better to try and earn as much money now and invest in development projects rather than rely on loans. On the other hand those who favour conservation argue that there can never be a good enough substitute for timber and the consumption of timber per capita is increasing in all countries the more developed a country is the higher the consumption per capita. This would also maintain the price of timber at a high level. Further more with developments in the technology of wood processing more and more use for timber is being found, for example the usage of tropical hardwoods in various paper furnishes has been increasing in the last 10 years. Considering that the annual coupe from Forest Reserves in Pahang is only 27,430 acres one wonders whether this would even be sufficient to supply local demand for timber say 25 years from

now when the population of the State would be nearly double if not more because of natural increase and net migration to the various land development schemes.

15. Taking these arguments into consideration I submit that it would be wise for the government to take measures to slow down the rate of exploitation of State Land Virgin forest compatible with the needs of agricultural development and the alleviation of land hunger among the populace. These measures which come within the area of conservation and regeneration will be discussed in the next chapter.

(C) Rate of Extraction

16. At this juncture a little need be said about the rate of extraction which directly affects the volume of outturn per acre of forest.

At the present rate of extraction the yield per acre for all categories of forests that have been worked from 1967 onwards is around 8 cubic tons per acre as shown in Table 2.1. A closer look at the categories worked where the percentage of "worked forests" is high in the total area worked the average is lower. This is necessarily so as the yield from these "worked forests" is very much lower than from virgin forests. Even among virgin forests the yield varies according to soil condition and terrain. It is known the forest in the Keratong area in Southeast corner of the State have the highest yields. In 1970 the highest yields so far seems to have been obtained despite the fact that

it is also the year in which the largest acreage has been worked. This extraordinary high yield per acre could be due to many factors. The main factor being market condition which influences the rate of extraction by increasing demand for certain species which hitherto had very little demand. Another important factor is that a high percentage worked during the year consists of choice areas in the Keratong and Jengka areas. But this is not to say that the maximum possible yield per acre has been approached. The estimated maximum possible yield per acre from the present identified species is around 25 cubic tons per acre.

17. Presently there are some 750 species of trees which have been identified. But only 30% of these species which constitute 60% of the wood volume of these species are utilized. Of the 750 species identified only 290 species may be said to have any commercial value at present. These are listed in Appendix II. The most popular of these species are in Groups B and C numbering 186.

18. Many factors are responsible for the under-utilization and non-utilization of these species. Some of these are:

(i) the sparse disposal of these species over wide areas.

(ii) the lack of knowledge of the quantities and species available in any area.

(iii) insufficiency or lack of knowledge of the qualities of these species.

(iv) lack of incentives to use the species.

(v) the inadequacy of most of the mills to utilize some of the lesser known species.

(vi) lack of effort in putting these species into the market as it is comparatively easy to obtain the more popular species.

19. It is important that this situation is corrected as early as possible. The underutilization and non-utilization of these species result in a loss of revenue to the State and Federal governments and a net loss of valuable asset to the nation as these are either burnt or left to rot as in the case of land that is being cleared for agricultural development. Considering that by extracting only about 60% of the available timber from its forest earned the State Government $28 million in 1970 it can be infered that if maximum utilization can be achieved the revenue that would be earned by the State by the opening of equal acreage of forests as in 1970 and charging the same rates of royalties and premiums would bring about $40 million into the State's Coffers.

20. How can extraction and utilization be maximised? What are the measures that would help to intensify extraction and encourage the maximization of utilization. It is suggested that some of these are:

(i) Research on the possibilities of varied uses of mixed species of timber should be speeded up and industry should be provided with all available knowledge on utilization of species or group of species in a manner that can be easily understood by manufacturers and consumers.

(ii) Incentives for the use of the less utilized or unutilized species of timber should be provided e.g. by temporarily reducing royalty rates on such species.

(iii) The government should encourage the setting up of chipping plants, charcoal plants, and particle board factories which can use timber not used by sawmills or plywood/veneer mills. Chipping plants for example can use mixed species and in sizes from 3" in diameter onwards. The co-operation of the various statutory bodies should be enlisted.

(iv) Actively promote the use and sales of presently little or unused timbers both locally and overseas.

(v) Many mill owners lack sufficient capital for improving their mills. Facilities for borrowing money at lower rates of interest on a long term basis should be provided e.g. from a fund established by collecting special cess for this purpose.

(vi) As far as possible wood processing mills should be grouped together in special industrial estates so that the collection and transportation does not involve prohibitive costs. This would encourage the use of waste product from wood processing mills.

21. A successful programme of intensification of extraction of forests and maximization of utilization of timber would mean that to earn the same amount of revenue the State can open a lower acreage per year. If at present 40% of the wood volume is not harvested the harvesting and utilization of this hitherto unharvested timber would permit the State to reduce the acreage

for logging each year and still earn the same amount of revenue. This would mean that more timber can be conserved for future harvesting and therefore would encourage investors to establish more sophisticated timber processing mills which require large capital investments. Conversely a policy that permits the opening of too much forest annually does not win the confidence of such investers.

CHAPTER III

CONSERVATION AND REGENERATION

In the previous chapter we have looked at the sources of supply of raw material for the timber industry in Pahang, the rate of exploitation of these sources and the flow of timber from these sources to the market. Some reference were made to measures taken to protect these sources or rather to conserve them so that the supply does not become completely depleted. In this chapter we shall look at these measures in greater detail.

2. Measures to conserve forest resources fall under two broad categories; positive and negative measures. Under positive measures the government provides for silvicultural treatment of forests to regenerate, enrich and reafforest. On the negative side there is the control of felling as to acreage, the size of trees that can be felled and the trees that should be felled.

3. The State Forest Officer is charged with the responsibility of advising the State Government on the formulation of policies to conserve and manage the forest resources of the State. He in turn is backed by the Federal Forest Headquarters which also runs a research institute at Kepong. The State Forest Officer is also charged with the task of implementing these policies and policing forest areas that are being exploited.

(A) Control of Felling

4. The authority that approves areas for felling is the State Executive Council. Before an application is tabled before the Executive Council it is vetted first by the District Forest Officer and then by the State Forest Officer.

5. Once an area is approved the premium has to be paid and the State Forest Officer apportions the approved areas into blocks to be felled year by year and issues licence for the felling of the first block. Before the logger can fell the next block he must report to the State Forest Officer that he has completed felling in the first block. The State Forest Officer then sends his men to check to make sure that all the timber that had been marked for felling is felled. Upon being satisfied that the previous block is completely exploited he will then issue licence for the felling of the next block.

6. These controls are exercised to ensure that: (a) the total area felled in any one period does not exceed the maximum, in the case of Forest Reserve this maximum is the annual coupe and (b) all the timber considered by the Forest Department to be merchandisable is felled.

7. These two conditions are designed to achieve the two seemingly conflicting objectives in the management of forest resources i.e. the maximum utilization of resources and the maintenance of perpetual supply. But experience in the last few years shows that neither of these two constraints are strictly

observed. The following tabulation illustrates the extent of overfelling of Forest Reserves between 1964 and 1970:

Year	Annual Coupe (Acres)	Acreage of Forest Reserves Actually Felled	Excess Felling (Acres)	Under Felling (Acres)
1964	23,600	16,837	-	6,763
1965	23,600	37,092	13,492	-
1966	23,600	22,064	-	1,536
1967	23,600	30,126	6,526	-
1968	23,600	45,308	21,708	-
1969	23,600	50,800	27,200	-
1970	23,600	50.136	26,536	-

TABLE 3.1

TABLE ILLUSTRATING THE EXCESS FELLING OF FOREST RESERVES IN PAHANG 1964-70

In some cases loggers leave certain species of logs to rot in the forest after felling them because no mill can make use of them either because they are not found in quantities large enough or because there is no demand. Consequently only about 50% of the timber that ought to be extracted according to the present stage of the development of the industry, is actually extracted.

8. In performing its role of policing logging operations the State Forest Department is handicapped by shortage of staff. This has been voiced by the State Forest Officer in the Department's

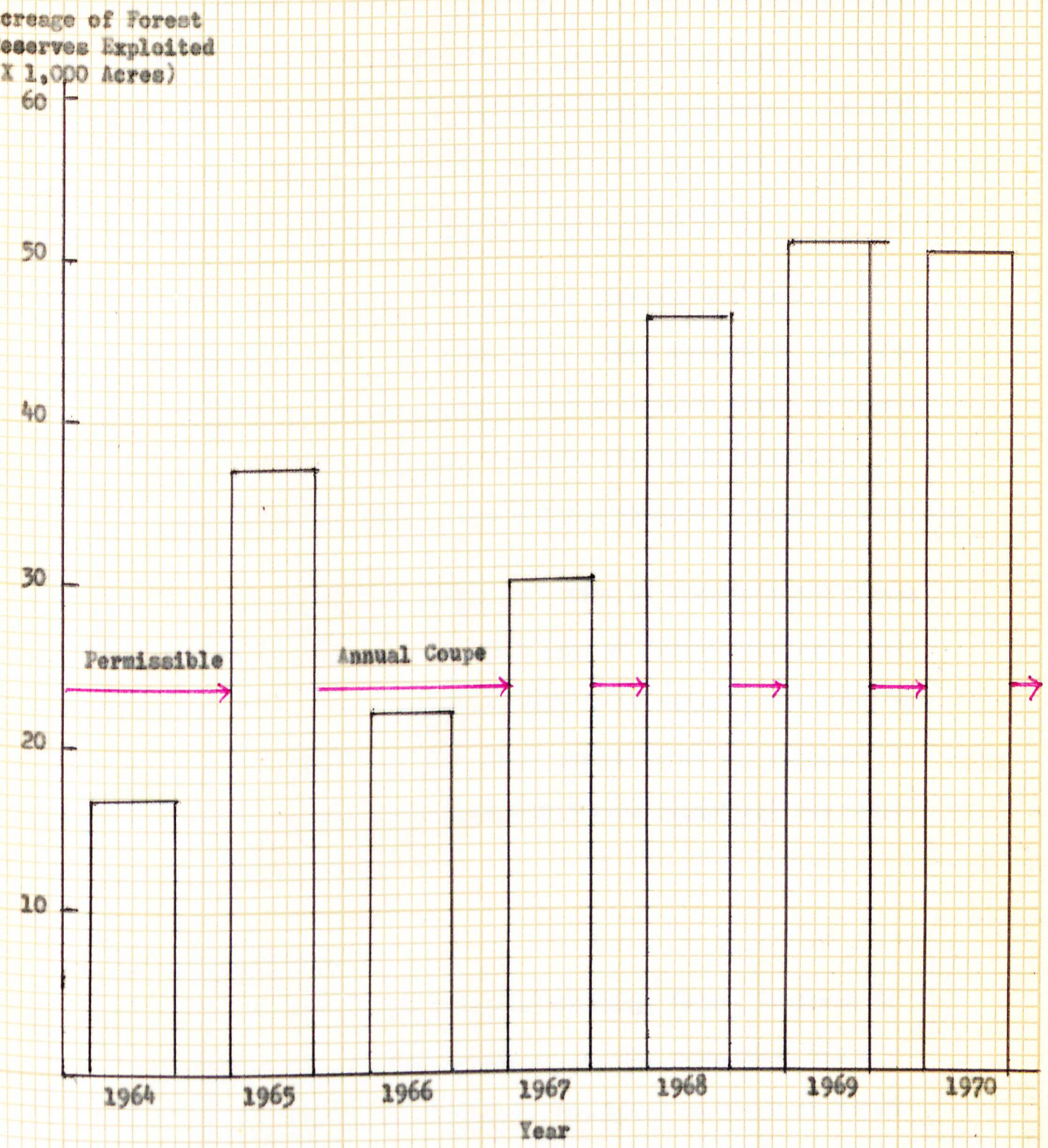

CHART 1

CHART SHOWING EXCESS FELLING OF
FOREST RESERVES 1964-70

Annual Report as early as 1968.[7] In 1968 the State spent 10,9% of its revenue from forests on the cost of management i.e. the expenditure in maintaining the State Forest Department. In 1970 the State earned $28.5 million dollars from forestry and spent $2.4 million or 8.4% on the State Forest Department.

9. However, even if checks are adequate the problem of underutilization will still persists. This problem is tied with the capacity of the processing sector to utilize mixed species of timber. A long term solution would be the establishment of factories and mills which can use these species in mixed quantities.

10. Incidents of felling in excess of predetermined blocks and stealing of timber from State Land or forest reserves occur occasionally but they cannot be said to be rampant. But they are an indication that with this rapid expansion in the logging industry the resources of the State Forest Department has been stretched to the full.

(B) Regeneration

11. As part of the system of managing Forest Reserves on the principle of sustained yield the Forest Department has a section that applies silvicultural treatment to areas of Forest Reserves as soon as all the valuable and marketable timber has been felled. As mentioned earlier only 1/70th of any area of Forest Reserve is opened for felling in any one year.

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[7] Laporan Tahunan, Ranchangan Pengusaha Hasilan dan Pemeliharaan Hutan Negeri Pahang 1968.

Theoretically if this system is followed strictly a given Forest Reserve can be a perpetual source of supply of timber.

12. The system used in West Malaysia is called the Malayan Uniform System which can be explained by the following chart. The whole cycle of silvicultural treatment takes 70 years from the completion of exploitation of a Forest Reserve area of its natural forest to the time when the regenerated forest is ready for harvesting. But the most crucial period is the first ten years. After that it is a matter of routine maintenance and general protection. Once an area has successfully completed this first ten years it is considered regenerated.

13. To date there are just over 3,000 acres of regenerated forest in the State i.e. forest which had undergone silvicultural treatment more than ten years ago. These are distributed as in Table 3.2. Besides these there are 46,000 acres of forests which had been treated but have not yet passed the ten-year mark.

14. Silvicultural work had been suspended since 1968 except for work on the Pinus Caribala Plantation at Bukit Tinggi. This is because of the uncertainty over the tenure of Forest Reserves following the Land Capability Classification which could result in the relocation of Forest Reserves. Since this has been more or less finalised it is hoped that this very important aspect of forest management will be resumed as soon as possible.

15. At Bukit Tinggi in Bentong District a Pilot Plantation Project over 17,000 acres was established in 1966 and to date

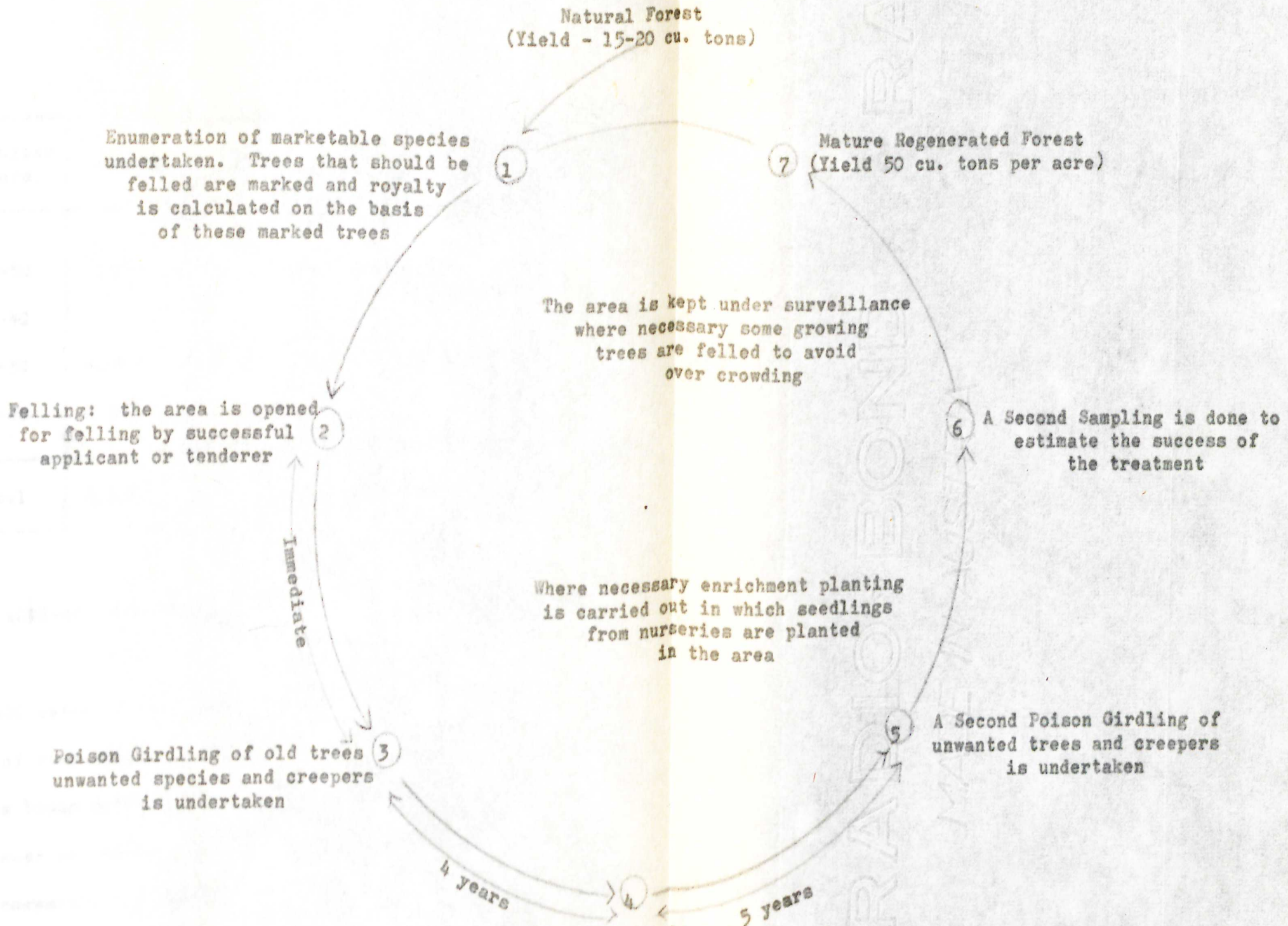

CHART 2

CHART SHOWING SILVICULTURAL TREATMENT CYCLE

Age Class (Years)	Acreage	Expected Year of Maturity	Estimated Yield on Maturity at 50 cu. tons per acre
40-50	150	1994	7,500
30-40	-	-	-
20-30	1,768	2014	88,400
10-20	1,114	2024	55,770
Total	3,032		151,670

TABLE 3.2

ACREAGE AND DISTRIBUTION BY AGE OF REGENERATED FOREST IN PAHANG

about 500 acres of poor forest had been felled and planted with a type of pine which can be grown in the tropics. The Specie is known as Pinus Caribaea which originates from British Honduras. This timber is suitable for making pulp and paper. It matures in the comparatively short time of 15 years. But Pinus Caribaea Plantation starts yielding from the eighth year after planting when the first thinning operation is undertaken when it will yield about 4 cubic tons an acre and again between the tenth and twelveth year at 6 cubic tons an acre when the second thinning operation is undertaken.

16. In its silvicultural work the State Forest Department is faced with two problems. The first the uncertainty over the tenure of Forest Reserves has been solved when a decision has been taken over the relocation of Forest Reserves. The second problem

is the insufficiency of funds and manpower required to undertake the work. The framers of the Interim National Forest Policy were aware of this reluctance on the part of States to provide sufficient funds and manpower for this work and stipulated that this responsibility be placed on the Federal Government who should finance this aspect of forestry from funds to be established from a collection of cess from the timber industry. It is hoped that this part of the policy is implemented as soon as possible so that silvicultural work can be updated.

CHAPTER IV

TIMBER PROCESSING

(A) The Sawmills of Pahang

Logging has nurtured the growth of sawmilling and plywood and veneer manufacturing in the State. During 1970, 83 sawmills and 5 plywood and veneer mills were in operation in Pahang. Together they processed 869,386 cubic tons of round logs. But the possible capacity of 83 sawmills and 5 plywood mills is double that figure. A modern and efficient sawmill with one breakdown saw and four resaws with automatic conveyors has the capacity to process 60 to 80 cubic tons of logs per day and about 15 to 20,000 cubic tons a year working 250 days a year. A plywood and veneer mill can process approximately 50,000 cubic tons of round logs a year. Therefore with 83 sawmills and 5 plywood and veneer mills the possible tonnage that could be processed is 1.6 million cubic tons. Many factors can contribute to this shortfall in effective capacity. The important factors are:

(i) Many of the older sawmills are small and obsolete. Hence their capacity is much lower than a modern sawmills using automatic conveyors and modern saws.

(ii) Contractual arrangement between loggers in the State and sawmills outside the State mostly in Singapore and Selangor.

(iii) Some of the logging areas which had apparently been approved to resident loggers had been sold to loggers who own wood processing mills outside the State.

(iv) Wood processing mills in Kuala Lumpur and in Singapore have an advantage over mills in Pahang because of the large scale of their operation and better equipments. In some cases the difference in distance may not be large enough or may not exist at all to give advantage to Pahang sawmillers when buying logs from areas in the Southwest and Southeast part of the State which are closer to Kuala Lumpur and Singapore respectively.

(v) For timber which is exported overseas the main ports of loading are still Singapore and Port of Klang. It would therefore not be economical to send logs to Kuantan or Temerloh and then to these ports for export.

(vi) Local demand for sawn timber forms only a small portion of the total outturn.

(B) Percentage of Timber Outturn Processed in Pahang

2 The percentage of the total log outturn processed in the State reached its lowest since 1964 in 1970 when the percentage was 25%. This is due to the fact that the increase in log outturn has by far outpaced the increase in the tonnage of logs that can be processed by local processers. While the total outturn has increased by five times between 1964 and 1970 the total tonnage processed in the State has only increased by two and a half times during the same period. Table 4.1 illustrates this trend.

Year	Total Outturn (cu. tons)	"Exported" (cu. tons)	Processed in the State (cu. tons)	Percentage of Outturn Processed in Pahang	No. of Mills	
					S/Mills	Ply/Mills
1964	659,660	483,304	332,026	50	64	-
1965	827,504	504,256	299,139	27.6	74	-
1966	1,164,349	521,279	349,975	31	72	-
1967	1,384,760	580,724	587,989	42.4	73	-
1968	1,830,826	1,029,577	783,383	42.8	74	1
1969	2,127,006	1,306,504	762,009	35.8	77	3
1970	3,452,579	1,722,130	869,386	25	83	5

*Source: Laporan Tahunan Ranchangan Pengusaha Hasilan dan Pemeliharaan Hutan 1968 (Pahang).

TABLE* 4.1

PERCENTAGE OF PAHANG'S LOG OUTTURN
PROCESSED IN THE STATE

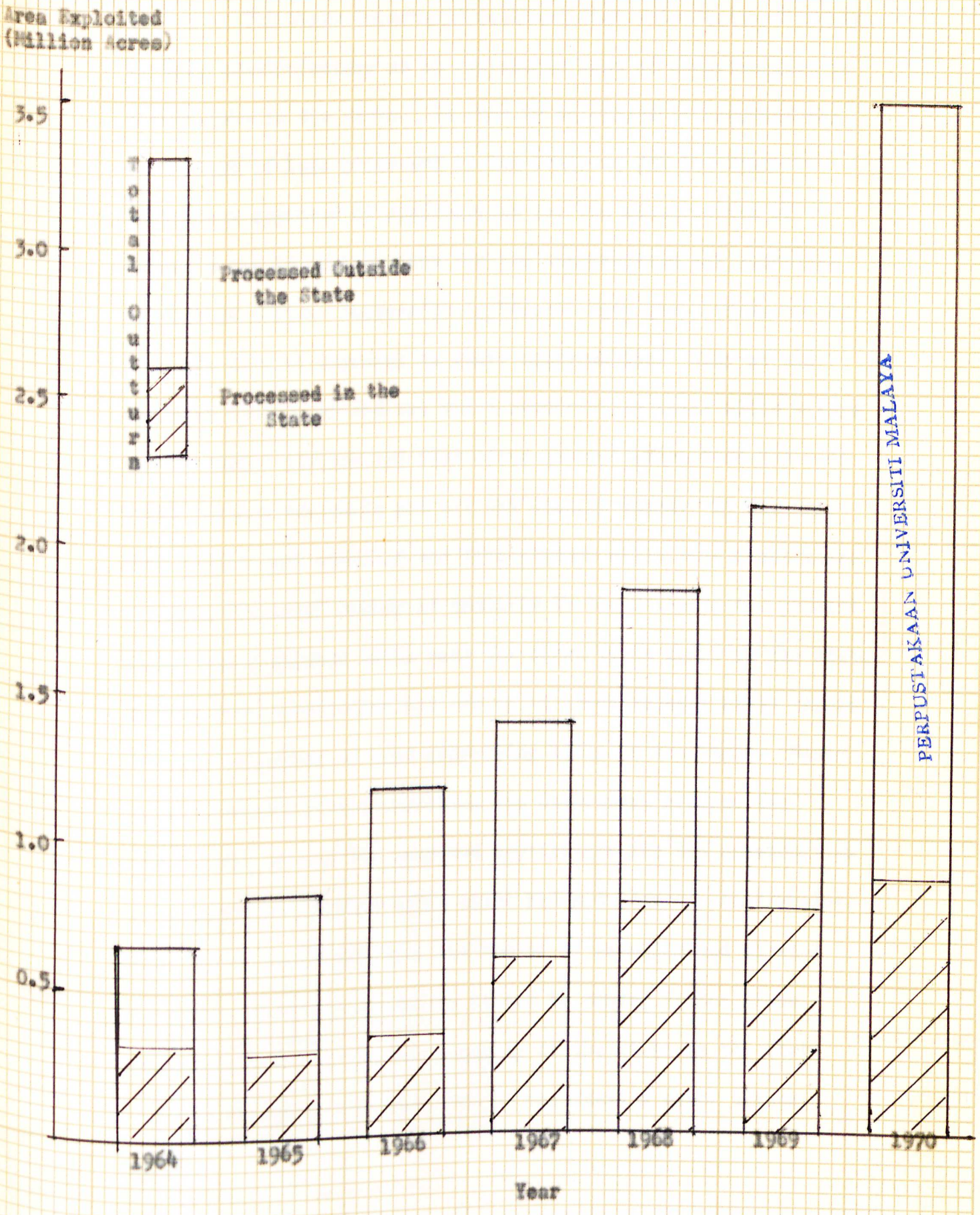

CHART 3

CHART SHOWING PROPORTION OF TOTAL OUTTURN PROCESSED IN THE STATE

3. The State Government realised that this State of affairs is very unsatisfactory as it represents loss of opportunities to create jobs in the State. In 1968 in an effort to increase the percentage of logs processed in the State to 75% the State Government approved 85 applications for the construction of sawmills and 15 applications for the construction and operation of plywood mills. Successful applicants were given three months from the date of approval to start construction. Many of the approved applicants did not start constructing their mills within the specified periods and even after several extensions had been given not all the mills got off the drawing board. By November 1969 only 11 new sawmills and five plywood mills were constructed bringing the total number of sawmills in the State to the present 83 and the 5 plywood mills were the first to be built in the State. By this time a committee was set up to study amongst other things the total capacity of wood processing mills in the State. Based on the findings of the committee the Government ordered the cancellation of all the approved application for the construction of sawmills and plywood mills which had not started construction. Thus, it is not likely that the number of sawmills and plywood mills will be increased unless it can be proved to the State Government that the present capacity of the mills in the State is not sufficient to process 75% of the State's total timber outturn.

(C) Recent Developments in Timber Processing in Pahang

4. Recent developments in the State are expected to increase the percentage of logs processed in the State in the near future. One of these is the establishment of large and integrated wood processing mills at Bukit Ibam by the Sharikat Kayu Kayan Bukit Ibam, in the heart of the Jengka Triangle by the Sharikat Kayu Kayan Jengka, both of which are government sponsored and at Pekan by the Mentiga Forest Products Sendirian Berhad a joint venture involving the government sponsored State Economic Development Board, a foreign company and a local timber magnate. These companies plan to process timber from round logs to semi-finished and finished products. But initially they start by extracting timber and selling them as round logs. Besides these there are in operation five large wood processing mills in the State which are highly mechanised and automated. The Sharikat Permodalan Pahang, a government sponsored finance company has plans to manufacture knock-down furniture for export. Another development which would have a strong influence towards processing more timber in the State is the proposed improvement of the Kuantan port under the Second Malaysia Plan.

The effect of the establishment of these large-scale processing mills would not be felt on the Pahang timber market until about 1975. This is because, as stated earlier, these big operators start in the ordinary way by trading in round logs. But by 1975 it is estimated that even without any further increase in the number of wood processing mills in the State the volume

that would be processed in the State would be at least 1.5 million cubic tons.

(D) The Movement of Pahang Logs to Other States and to Singapore

5. The bulk of the total timber outturn of Pahang is processed outside the State. As shown in Table 4.1 in 1964 50% of the total outturn was sent out of the State in round logs. In 1970 75% was "exported" in unprocessed form. In 1968 out of a total outturn of 1,830,826 cubic tons produced some 1,039,597 cubic tons were sent out in unprocessed form. Of this 553,340 cubic tons went to Singapore, 79,000 cubic tons to Johore, 471,642 cubic tons to Selangor, 23,577 cubic tons to Perak, 4,830 cubic tons to Negri Sembilan, 3,535 cubic tons to Pulau Pinang and the rest exported directly overseas. Since 1962 Selangor has been "importing" increasing amounts of timber from Pahang. In that year Selangor imported 172,822 cubic tons, in 1964; 249,250 cubic tons, and in 1966, 322,105 cubic tons.

6. In the past Singapore has been drawing the bulk of her round log imports from West Malaysia. This is reflected in Statistics published in the Malaysian Report on Forest Administration which devotes one chapter to include the Annual Report of the Singapore Timber Officer. But this practice was discontinued after 1965. Between 1957 and 1965 80% of Singapore's imports of round logs come from West Malaysia. Although the figures for the total imports of round logs into Singapore are not available after 1965 it known that Indonesia under the new regime

has begun exploiting her forest resources in a big way. It is to be expected that Singapore will have alternative sources of supply for her timber imports not very much farther than sources in West Malaysia. This development is bound to affect Pahang's timber trade. It may add impetus to the drive to get more timber processed in the State.

7. It is estimated that the total inputs required by local processors would rise from 950,000 cubic tons in 1971-72 period to 1,225,000 cubic tons annually from 1975 onwards. (Please see Table 4.2). In computing the estimated figures shown in Table 4.2 it is assumed that no new mills are approved and that there will be no major upheaval in the international timber trade. The total outturn of logs is expected to be steady around 3 million cubic tons annually until 1990. (Please see discussion in Chapter II). A comparison of the total outturn figures and total input requirement by local processors shows that Pahang will continue to be a net exporter of round logs until 1990, after which there will be a sharp drop in supply from local sources resulting in the necessity to import about 863,000 cubic tons of round logs.

8. It is therefore clear that total capacity of all wood processing mills in Pahang is still not sufficient to process even 50% of the expected annual timber outturn in the State. A review is therefore urgently required to determine whether the present policy of limiting the number of wood processing mills in the State to the present strength is wise. The earlier this is carried out the better as the opportunity for increasing the

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Year	Input Required by Local Processors (cu. tons)				Total Requirement by Local Processors (cu. tons)	Total Cutturn (cu. tons)	Balance+ Deficit-
	Existing Mills*	New Integrated Mill Complexes at					
		Jengka	Bukit Iham	Pekan (Hentiga Forest Products)			
1971	900,000	50,000	-	-	950,000	3,336,450	+2,636,450
1972	900,000	50,000	-	-	950,000	3,336,450	+2,636,450
1973	900,000	100,000	50,000	50,000	1,100,000	3,336,450	+1,236,450
1974	900,000	125,000	50,000	50,000	1,125,000	3,336,450	+1,211,450
1975	900,000	125,000	100,000	100,000	1,225,000	3,336,450	+1,211,450
1976	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1977	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1978	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1979	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1980	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1981	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1982	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1983	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1984	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1985	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1986	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1987	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1988	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1989	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1990	900,000	125,000	150,000	100,000	1,275,000	3,336,450	+2,061,450
1991	900,000	125,000	150,000	100,000	1,275,000	411,450	-863,550

*Based on 1970 input.

TABLE 4.2

A FORECAST OF INPUTS REQUIRED BY PAHANG PROCESSORS 1970-91

capacity of wood processing mills in the State will be present only for the next twenty years which may be just long enough to attract investors. It must be remembered that advanced wood processing mills require heavy capital outlay and therefore would require time to recover the investments made. Unless this opportunity to increase job opportunities is taken early it may be lost forever.

9. How much does this low percentage of logs processed in the State cost Pahang in terms of jobs may be seen from the fact that while Pahang produced 56% of the total timber outturn of West Malaysia in 1969 the number of people employed in sawmills and plywood mills in Pahang in the same year was only 2,437 out of the total number of 14,756 or 16.5%.

CHAPTER V

BUMIPUTRA PARTICIPATION IN THE TIMBER INDUSTRY IN PAHANG

The timber industry lends itself very well to governmental control as the raw material is to all intents and purposes considered as State property. Hence in its efforts to encourage and increase Bumiputra participation in commerce and industry the timber industry is an obvious choice as the tools of this policy.

(A) Measures Taken to Encourage Bumiputra Participation in the Timber Industry

2. Since 1964 the State Government has taken positive steps to encourage and increase Bumiputra participation in wood-based industries, particularly logging and later sawmilling and other timber processing in the State. Five distinct steps were taken to achieve this:

(i) Allocation of Logging Areas

In this matter the government took steps to ensure that at least an equal share of the areas are allotted to Bumiputra loggers.

(ii) Issue of Sawmill Licences

The government encouraged and in some cases made it a condition for Bumiputra loggers who were approved an area above a certain acreage to set up sawmills. Preference was also given to Bumiputra applicants in considering application for the construction and operation of sawmills.

(iii) The Establishment of a Logging Training School.

(iv) The inclusion of a condition requiring the recruitment of a minimum of 50% of the labour force from among Bumiputras in all licences, permits and agreements.

(v) Government participation in the industry through State Statutory bodies.

How effective have these steps been in increasing Bumiputra participation? Let us examine each step one by one:

(i) Allocation of Logging Areas

3. The following Table 5.1 gives a comparison of the areas given to Bumiputras and non-Bumiputras. Table 5.1 shows that between 1964 and 1970 55% of the acreage issued under licence were allocated to Bumiputras and of the acreage opened up under agreement 71% were given to Bumiputras. However the average acreage per licence or per agreement in respect of licences and agreements for Bumiputras were smaller than those for non-Bumiputras. There seems to be a conscious effort to increase the number of Bumiputras who receive some benefit from the opening up of forest. This is borne out by the fact that in the middle of 1970 the State Government, under pressure from certain groups of Bumiputras who keep applying for logging areas, decided to set aside two areas 90,000 acres and 16,000 acres at Jengka and Sungai Koyan-Kampong Dusun respectively to be distributed in shares of 50 acres each to a total of 4,820 individuals. They were however not allowed to work the area themselves and instead the Lembaga

Year	Licences Issued to Individuals				Agreement Areas			
	Bumiputra		Non-Bumiputra		Bumiputra		Non-Bumiputra	
	Number	Area (Acres)	Number	Area (Acres)	Number	Area (Acres)	Number	Area (Acres)
1964	87	70,963	143	126,926	49	48,311	49	44,050
1965	230	141,289	154	125,856	10	10,000	10	22,560
1966	130	100,550	166	130,024	266	219,793	21	17,705
1967	143	103,222	114	90,993	75	64,687	32	26,118
1968	150	116,959	100	78,097	28	38,186	26	20,476
1969	243	138,437	166	13,560	50	48,903	26	28,990
1970	668	252,663	300	168,300	47	38,794	32	29,535
Total	1,651	924,083	1,143	733,756	525	469,674	196	189,434
Average Per Licence/ Agreement		559		642		894.6		966.4
Percent (Approx.)		55.7%		44.3%		71%		29%

Source: Compiled from Laporan Tahunan Ranchangan Pengusaha Hasilan dan Pemeliharaan Hutan Negeri Pahang.

TABLE 5.1

ACREAGES OF LOGGING AREAS ALLOCATED TO BUMIPUTRAS AND NON-BUMIPUTRAS 1964-70

Kemajuan Negeri Pahang (the State Economic Development Board) was appointed a trustee for the 90,000 acre lot at Jengka to work the area and pay out dividends from the proceeds to its 4,500 shareholders. The area at Sungai Koyan was to be tendered out to local loggers and the proceeds to be divided among its 320 shareholders. Since the 90,000 acre lot at Jengka would not give a 50 acre share to the 4,500 shareholders already selected a further 135,000 acres is expected to be added to this lot.

(ii) Issue of Sawmill Licences

4. In this branch of the timber industry Bumiputra participation is almost negligible. On paper 6 out of the 72 sawmills in operation at the end of 1969 were in the name of Bumiputras. However it is questionable whether all the six sawmills are actually operated by Bumiputras. Of the 11 new sawmills approved in 1969 six were approved to Bumiputra companies. By the middle of this year the construction of these 6 new Bumiputra sawmills were nearing completion and hopefully they will be run by Bumiputras. As at the end of March 1971 no plywood/veneer mills have been approved to Bumiputra companies or individuals.

(iii) The Establishment of a Logging School

5. Realising that the percentage of Bumiputras among the labour force employed in the timber industry is very small the State Government established a Logging Training School at Belimbing near Maran in 1967 to provide vocational training to Bumiputra youths in the various skills and trades in the timber industry. The curriculum includes amongst others the art of felling trees.

the use of power saws, tractor operation and the operation of the various machines used in sawmills. The aim is to increase the percentage of Bumiputras among the labour force employed in the timber industry. Some progress seems to have been made towards this objective but the increase is much too small i.e. from 25.3% in 1967 to 34.8% in 1969. The following Table 5.2 illustrates this.

Year	Total Labour Force in Sawmills and Plywood Mill	Bumiputras in Sawmill and Plywood Mills	Percentage
1957	665	102	15.3
1958	512	54	10.5
1959	569	64	11.2
1960	878	127	14.5
1961	880	146	16.6
1962	1,286	211	16.4
1963	1,325	204	15.4
1964	1,557	310	20.0
1965	1,674	344	20.0
1966	1,835	387	21.0
1967	2,149	545	25.3
1968	2,278	782	34.3
1969	2,437	849	34.8

Source: State Forest Department.

TABLE 5.2

BUMIPUTRA EMPLOYMENT IN SAWMILLS AND PLYWOOD MILLS

(iv) Imposition of a Minimum Quota of Jobs for Bumiputras

6. Since 1965 all permits, licences and agreements require the logger to employ at least 50% of the workers from Bumiputras. But no machinery was set up to supervise this and consequently this condition seems to be rarely complied with. There are no record of any licence or permit having been penalised for non-compliance with this condition.

(v) Government Participation in the Industry

7. As a further step to increase Bumiputra participation in the timber industry the State Government itself participates in the industry. This is done in two ways:

(i) Areas are alloted to the Lembaga Kemajuan Negeri Pahang (LKNP) which in turn enter into joint venture with private loggers and sawmillers to work the areas and process the logs. In agreements establishing the joint venture the LKNP will stipulate the minimum percentage of Bumiputras to be employed.

(ii) The State Government set at the Sharikat Perkayuan Ibam to work large areas of forest to be cleared for development. The State provides capital for this company to construct sophisticated and integrated timber processing complex at Bukit Ibam in the centre of the Pahang Tenggara Integrated Development Project which aims to open 2.5 million acres for agriculture.

These measures are taken not only to increase the number of Bumiputra employed in the industry but also to demonstrate to the private sector that extraction can be more intensive and more

profitable. It is still premature to judge the results of these measures as they had been executed only recently.

(B) Some Factors which Hinder the Growth of Bumiputra Participation

8. Despite massive government effort to increase Bumiputra participation in the timber industry as outlined in the foregoing paragraphs Bumiputras are still nibbling at the edges and are in the main satisfied with the crumbs. Areas are sold for a fraction of what they are really worth. What then are the factors which inhibit Bumiputra participation in the industry? Why are the areas allotted to them sold or sub-contracted? The following are some of the factors which to my mind are the main obstacles:

(i) lack of capital among Bumiputras as a group and this is made worse by the fact that availability of capital is not a prime consideration in approving areas to Bumiputras.

(ii) lack of know-how and in most cases also of business acumen among Bumiputras who are favoured with logging areas. This factor alone makes it very difficult for lending institution to lend money to those who are in possession of logging areas.

(iii) even when a Bumiputra logger have the know-how and the capital to extract timber from his lot he finds it difficult to sell his logs as most of the sawmills are owned and operated by non-Bumiputras who have their own suppliers. In most cases areas allotted to Bumiputras are too small for them to find business justification to set up their own sawmills. Even when they can process their own timber into sawn timber the same marketing difficulty is faced when they want to sell sawn timber unless they are given export licences.

(iv) in many cases approval of logging areas are not based on proven ability in the business or availability of capital but on other consideration such as political. This very often lead to the areas being sold or sub-contracted.

(v) lack of experience among the management in some Bumiputra companies lead to failure and financial loss and consequently sale of their logging areas to non-Bumiputra loggers.

(vi) although the government stipulates a quota for the employment of Bumiputras with every licence issued no special effort to see that it is implemented. The task of supervising the quota is left to the already over loaded Forest Department.

(C) Prospects for Bumiputra Participation in the Timber Industry in Pahang

9. To my mind the chance of success for effective and meaningful Bumiputra participation in the timber industry lies not with the individual Bumiputra logger or sawmiller who participate as sole proprietors or in partnerships but in large government sponsored firms where the government agent, be it the Lembaga Kemajuan Negeri, the Sharikat Permodalan Negeri or even MARA holds a controlling share in the management. It is important that the Government agency be in control so that the government has the major say in the selection of the management personnel, and check on the general management of the Company. With government participation in the shares of the companies the magnitude of the operation can be on a large scale i.e. embracing logging, sawmilling, plywood/veneer manufacture and ideally more

advanced processing so that the end product could be finished products like mouldings, parts of knock down furniture, ready-made doors and windows, parquet etc.

10. It is encouraging to note that since 1970 the State Government has started to proceed along these lines with the establishment of a large integrated timber complex at Bukit Ibam (see paragraph 8 (ii)), the allocation of 15,000 acres to Sharikat Permodalan Pahang, and the appointment of the Lembaga Kemajuan Negeri as trustees to exploit areas allotted to large groups of individuals. The last mentioned is necessary politically[8] and provides an acceptable compromise between the previous practice of allotting areas to influential individuals and the present policy of establishing wholly-owned government companies to exploit the forest.

11. The establishment of large government sponsored companies whose capital are made up of contributions by statutory bodies although strictly cannot be counted as Bumiputra equity participation contribute to the progress of Bumiputra participation in two ways: firstly it increases the employment of Bumiputras in the timber industry at various levels and secondly as a result of the first it creates a pool of Bumiputras who are trained in the various skills required in the industry including management and marketing.

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[8] It is evident to the writer that this measure was taken to relieve pressure on the government from those who claim a share in the timber resources but who have neither the know-how nor the capital to work forest areas if granted.

12. Meanwhile private Bumiputra individuals or firms can be allowed to have a share in the industry but before areas are allotted to them tests should be applied to ensure that they are bona fide loggers and sawmillers who really intend to go into the business and who are adjudged to have the capacity to do so.

CHAPTER VI

CONCLUSION

In the last fifteen years the timber industry in Pahang has grown tremendously in volume and turnover. However, the basic character of the industry has not changed very much. Processing has mainly been limited to the secondary level only. However, for West Malaysia as a whole there has been some encouraging signs that at least the variety and the degree of sophistication of the industry has increased slightly in the past few years with the setting up of plywood factories, chipping plants and a particle board factory to maintain some of the more important ones. In Pahang in particular the last three years has seen the introduction of plywood and veneer mills and the advent of integrated sawmills.

2. But all these can be traced not to a plan for the development of the timber industry but mainly to land development plans. It is therefore submitted that this is a good time to pause amidst this rapid growth in the exploitation of forest and give some thought to planning the overall development of the industry. There should be an integrated plan for forest development and forest industries development so that haphazard growth and wasteful practices can be eliminated. It is time to ask whether organizations and authorities charged with forest

management and the development of industries are adequate for the development of forestry and forest industries, whether the legal framework is adequate and conducive to development, and whether there is enough trained manpower both in the public and private sectors. It should be noted that the basic laws, the Forest Enactment and the Forest Rules were enacted forty years ago. Since then various rulings and policy decisions have been added and appended to them to form what is now the forest policy and the legal and administrative framework in which the industry operates. It is therefore worthwhile to examine this framework piecemeal and determine whether it is conducive to the healthy development of the industry. It must also be remembered that present day conditions facing the industry is very different from conditions that prevailed even fifteen years ago. Due to the advancement in technology large scale operations are possible and indeed desirable if Malaysian loggers and processors are to be able to compete successfully with their counterparts in Indonesia for example where supplier of tropical hardwoods are more plentiful. Therefore government policy with regard to size of lots allocated would have to be such as to encourage large scale operations and be compatible with modern wood technology. With these advancements in technology the capital outlay required to set up timber processing plants and to buy extracting equipments are high. Therefore investors would require a reasonable assurance that timber will be available to feed these plants long enough for them to recover their investment.

3. As stated elsewhere in this paper the management of forests involves conflicts between the objectives of maximizing present earnings from forest resources and the need to conserve and protect forests for the maintenance of supply in perpetuity and the protection of soil, the avoidance of floods and preserving the climatic condition of the country. There is also the conflict between maximizing revenue from taxation and the promotion of wood based industries. The national interest can best be served through a careful assessment of the range of options which recognize these interests and the adoption of proper plans for the development of the forest and forest industries.

APPENDIX A

INTERIM NATIONAL FOREST POLICY FOR THE STATES IN MALAYSIA BARAT

1. Preliminary

Whatever Forest Policy may be adopted by Malaysia Barat, it must be radically influenced by, and be consistent with three considerations now stated: firstly, that the uneven development of the country has led to a condition in which many States are, and will remain, dependent on others for supplies of forest produce; secondly, that because of the Forest Policy of Malaysia Barat is an integration of the policies of the individual States which comprise it, any departure from accepted principles on the part of any State Government must affect the others and the States of Malaysia Barat as a whole; and thirdly, that the attainment of supply in perpetuity of timber and other produce for Malaysia Barat must be viewed and planned from a Federal stand-point.

2. General Statement of Policy

The Federal Government of Malaysia together with the several State Governments DECLARE that the Interim National Forest Policy of the States in Malaysia Barat shall be:

(i) To dedicate to permanent forest for all time a portion of the forest lands of the country sufficient:

(a) to ensure the sound climatic and physical condition of the country, the safeguarding of water supplies and soil fertility, and the prevention of damage by flooding and erosion to rivers and padi and other agricultural land; such forest lands being known as Protective Reserves;

(b) for the supply in perpetuity at reasonable rates of all forms of forest produce which can be economically produced within the country and required for agricultural, domestic and industrial purposes, and for exports, such forest lands being known as Productive Reserves;

(c) to ensure adequate sites for continuing forest research.

(ii) To manage the Forest Estate with the object of obtaining the highest possible revenue compatible with the principle of sustained yield, and with the primary objects as set out above. For successful management, long term planning and security of tenure are essential.

(iii) To promote thorough and economical utilisation of forest produce on land not included in the Forest Estate, prior to the alienation of such land.

(iv) To foster, by education and publicity, a proper understanding among the people of the value of forest to them and their decendants.

3. Constitution of Forest Estate

The most desirable Forest Estate is one that assures the realisation of both the objects of protection and production as laid down in paragraph (1) of the General Statement of Policy. It is desirable in selecting areas for constitution as Forest

Estate, however, that the following considerations are given the weight:

(i) The nature of the terrain may limit the potential productivity of a forest. It is therefore not always possible to combine the objects of protection and production.

(ii) In order to provide conveniently for local demands for forest produce, productive Forest Estate should be distributed as evenly as possible throughout the country, provided this is in conformity with a sound land use policy.

(iii) Timber is a heavy and bulky commodity, difficult to transport. Potentially productive forest should be provided with reasonable access to the principal lines of communication.

Protective Forest Estate should never be alienated, save in the most exceptional circumstances and after the most careful objective study. One of the purposes of such study will be to ensure that alternative protective measures are practicable and can be enforced.

The Forest Land which will be set aside for productive and protective purposes in accordance with the Interim National Forest Policy following the result of the land capability classification survey will not only meet the changing demand for wood and other forest products in the country, but will also serve to ensure that the soil conservation, watershed management, will life, recreational, and aesthetic requirements of the country are satisfied.

There are strong conservation reasons for including most of the unproductive forest areas, particularly the steep mountainuous regions and many areas of coastal and inland swamp, within the National Forest Estate. In this way these forest areas can be maintained in a manner which will enable them to play their full conservation role and contribute to the national well-being. Inclusion of such areas of land within the National Forest Estate will also favour the research and development which might be necessary to convert these areas into productive forest in the future and to develop the recreational potential which is inherent in large areas of Malayan forest.

4. Management of Forest Estate

The Director of Forestry or his representative is responsible to give advice to the State Government through the State Forest Officer for the management of Forest Estate. He is to ensure that productive forests are so managed that they will provide the highest possible sustained yield of timbers and other forest produce, in the interest of the nation. The full annual coupe in productive forest should be exploited and regenerated as soon as possible.

Where protection of soils and water is the primary object of a Forest Estate, the Director of Forestry or his representative shall advice through the State Forest Officer on the control of exploitation of forest produce in such a manner that the protective value of the forest is not impaired.

From now until the time when the results of the land capability classification are announced, except where land capability studies have been made, the existing Forest Reserves shall remain as such and the Interim National Forest Policy shall generally apply except that silvicultural work will be confined to areas with an average slope of not less than 20° and to areas of the order of 5,000 acres and larger. However smaller areas and lower slopes shall not be precluded form being utilized for forest research and other related activities.

5. Exploitation of Forests Outside Forest Estate

The Forest Service is to ensure that, as far as may be possible the utmost use is made of forest produce on all lands prior to their cultivation. The Commissioner of Lands and all Land Officers are to cooperate with the Forest Services in realising the greatest possible use of the forests.

These forests on State land, being forests which are not required for the permanent forest estate, form an additional and expendable reserve of timber, and should only be exploited:

(i) subject to condition similar to those imposed for forest estate, and

(ii) immediately prior to alienation; or

(iii) as may be necessary to supplement production from productive forest estate, if the full annual coupe in the latter is, in the opinion of the State Forest Officer, insufficient to supply the requirements of the State for internal use; or

(iv) if the Minister of National and Rural Development and the State Government are satisfied that the area is satisfied that the area is required for the purpose of carrying out development projects or the exploitation of natural resources other than timber.

and that the exploitation should be under a licence issued after the invitation of tenders:

Provided that in special circumstances where the invitation of tenders for the issue of such licences will not be in the interest of the Government generally, and particularly for the purpose of implementing the Government policy on Malay participation in commerce and industry, the Menteri Besar of the respective State may in his discretion issue such licences otherwise than by tender.

6. Exploitation of Forest

As a rule no sawmill shall be built or operated without the permission of the Forest Department. It is essential to ensure that the capacity of such institutions does not exceed the productivity of the forests that are available as sources of Supply.

In appropriate cases the State Government will be willing to guarantee to an institution sufficient areas of forest to ensure the supply of raw material for a specific period according to its licenced capacity.

7. Forestry Research

(i) The Federal Government will ensure the provision of funds necessary to continue and to enlarge facilities for all aspects of forest research and greatest possible sustained outturn of forest produce from the Forest Estate, to develop its utilization and to foster the development of the forest products industry.

(ii) The Federal Government will provide technical advice on forest problems and therefore close co-operation is to be maintained between the Forest Research Institute and the State Government.

(iii) The Forest Research Institute shall carry out research on worked out mining lands in order to determine whether such lands may be rehabilitated for forestry.

8. Education in the Value of Forest

It is evident that a large part of the population of the country still fails to appreciate the productive and conservation value of an adequate area of forest. Forest Officers and other Government officials are to be encouraged to provide suitable lectures, broadcast talks, and articles in the press. In schools the encouragement of an interest in natural history and a sound education in physical geography may be regarded as the first important step towards public understanding of the natural important of forests.

9. Finance

So that silviculture and other works of improvement could be more effectively done, the Federal Government will assume

responsibility for financing all approved schemes of the States on the basis of a levy to be imposed on the industry at a rate to be determined after consultation with the State Government.

APPENDIX B

LISTS OF APPROVED SPECIES

List A

Heavy Hardwoods (HHW)

No.	Species Symbol	Vernacular Name	Botanical Name
1	B	Balau	Shorea spp.
2	BB	Balau Bukit	S. foxworthyi
3	BGJ	Balau gajah	S. submontana
4	BGN	Balau gunong	S. ciliata
5	BH	Balau hitam	S. atrinervosa
6	BK	Balau kumus	S. laevis
7	BKH	Balau kumus hitam	S. maxwelliana
8	BKU	Balau kuning	S. flava
9	BL	Balau laut	S. glauca
10	BM	Balau merah	S. collina
11	BP	Balau pasir	S. materialis
12	BPT	Balau puteh	S. lumutensis
13	BT	Balau tembaga	S. exelliptica
14	BTS	Bitis	Madhuca utilis
15	BTB	Bitis bukit	Palaquium stellatum
16	BTP	Bitis paya	P. ridleyi
17	C	Chengal	Balanocarpus heimii
18	DLM	Damar laut merah	Shorea kunstleri

No.	Species Symbol	Vernacular Name	Botanical Name
19	G	Giam	Hopea nutans
20	GJ	Giam jantan	H. semicuneata
21	GLB	Giam lintah bukit	H. helferi
22	KTG	Kekatong	Cynometra inaequifolia
23	KJ	Keranji	Dialium spp.
24	KJBL	Keranji bulu	Dialium kingii
25	KJKB	Keranji kuning besar	D. platysepalum
26	KJKK	Keranji kuning kechil	D. wallichii
27	KJPA	Keranji paya	D. patens
28	MLT	Malut	Hopea ferrea
29	MMB	Membatu	Shorea guiso
30	MMJ	Membatu jantan	S. ochrophloia
31	M	Merbau	Intsia palembanica
32	PGA	Penaga	Mesua ferrea
33	RDP	Resak daun panjang	Vatica nitens
34	RDR	Resak daun runching	Vatica cuspidata
35	SGD	Sengkawang darat	Shorea scrobiculata (Syn. Shorea Meadiana)
36	TP	Tembusu padang	Fragrea fragrans
37	TS	Tempinis	Strebulus elongatus (Syn. Sloetia elongata)

List B

Medium Hardwood (MHW) or Light Hardwood (LHW)

Preferred Species

No.	Species Symbol	Vernacular Name	Botanical Name
38	DM	Damar minyak	Agathis alba
39	EK	Ekor kuda	Dacrydium elatum
40	ES	Ekor sabit	D. falciforme
41	ET	Ekor tupai	D. beccarii
42	GG	Geronggang	Cratoxylon arborescens
43	GGU	Gerutu gerutu	Parashorea lucida
44	GPS	Gerutu pasir	P. densiflora
45	JL	Jelutong	Dyera costulata
46	KLN	Keledan	Dryobalanops oblongifolia
47	KPR	Kapor	Dryobalanops aromatica
48	KPS	Kempas	Koompassia malaccensis
49	KBN	Keruing baran	Dipterocarpus eurynchus (Syn. Dipterocarpus appendiculatus)
50	KBD	Keruing beludu	D. obtusifolius
51	KBL	Keruing belimbing	D. grandiflorus
52	KBT	Keruing bukit	D. costatus
53	KBU	Keruing bulu	D. baudii
54	KCH	Keruing chogan	D. rigidus
55	KET	Keruing etoi	D. dyeri

No.	Species Symbol	Vernacular Name	Botanical Name
56	KGS	Keruing gasing	D. penangianus
57	KGB	Keruing gombang	D. cornutus
58	KGM	Keruing gombang merah	D. kunstleri
59	KGL	Keruing gondol	D. kerrii
60	KGN	Keruing gunong	D. retusus
61	KKU	Keruing kelabu	D. pseudofagineus
62	KKS	Keruing kertas	D. chartaceus
63	KKT	Keruing kerut	D. sublamellatus
64	KKE	Keruing kesat	D. gracilis
65	KKP	Keruing kipas	D. costulatus
66	KLT	Keruing latek	D. apterus
67	KMP	Keruing mempelas	D. crinitus
68	KMG	Keruing mengkai	D. rotundifolus
69	KMR	Keruing merah	D. verrucosus
70	KPT	Keruing pipit	D. fagineus
71	KRP	Keruing ropol	D. hasseltii
72	KSO	Keruing sol	D. lowii
73	KTN	Keruing ternek	D. palembanicus
74	MLW	(see RMW List B)	
75	MLN	Melunak	Pentace spp.
76	MNG	Mengkulang	Heritiera spp.
77	MNGJ	Mengkulang jari	H. javanica
78	MNGS	Mengkulang siku keluang	H. simplicifolia
79	MBK	Meranti bakau	Shorea uliginosa (Syn. Shorea rugosa var. uliginosa)

No.	Species Symbol	Vernacular Name	Botanical Name
80	MBU	Meranti batu (dahulu kira MBT)	Shorea dasyphylla
81	MBL	Meranti belang	S. resinosa
82	MBT	Meranti bukit (dahulu MBT kira meranti batu)	S. platyclados
83	MBB	Meranti bumbong	S. dealbata
84	MBN	Meranti bunga	S. teysmanniana
85	MDB	Meranti daun besar	S. hemsleyana
86	MJT	Meranti jerit	S. sericeiflora
87	MKP	Meranti kepong	S. ovalis
88	MKH	Meranti kepong hantu	S. macrantha
89	MLG	Meranti langgong	S. lepidota
90	MLP	Meranti lapis	S. lamellata
91	MBL	Meranti melantai	S. macroptera
92	MEM	Meranti mengkai	S. bentongensis
93	MPA	Meranti pa'ang	S. bracteolata
94	MPY	Meranti paya	S. platycarpa
95	MPJ	Meranti pepijat	S. johorensis (Syn. S. leptoclados)
96	MPT	Meranti pipit	S. assamica f. globifera
97	MPS	(see GPS List B)	
98	MRD	Meranti rambai daun	S. acuminata
99	MSP	Meranti sarang punai	S. parvifolia
100	MSPB	Meranti sarang punai bukit	S. ovata
101	MSM	Meranti sengkawang merah	S. singkawang

No.	Species Symbol	Vernacular Name	Botanical Name
102	MTK	Meranti temak	S. hypochra
103	MTN	Meranti temak nipis	S. talura
104	MTB	Meranti tembaga	S. leprosula
105	MTU	Merbatu	Parinari spp.
106	MA	Mersawa	Anisoptera spp.
107	MAD	Mersawa durian	A. laevis
108	MAG	Mersawa gajah	A. scaphula
109	MAK	Mersawa kuning	A. curtisii
110	MAM	Mersawa merah	A. megistocarpa
111	MAP	Mersawa paya	A. marginata
112	MAT	Mersawa terbak	A. oblonga
113	NEM	Nemesu	Shorea pauciflora
114	PBT	Podo bukit	Podocarpus neriifolius
115	PCA	Podo chuchor atap	Podocarpus imbricatus
116	PKM	Podo kebal musang	P. blumei
117	PN	Punah	Tetramerista glabra
118	RM	Ramin	Gonystylus spp.
119	RME	Ramin dara elok	G. affine
120	RMW	Ramin melawis	G. bancanus
121	RMM	Ramin pinang muda	G. confusus
122	RMP	Ramin pipit	G. maingayi
123	S	Seraya	S. curtisii
124	SRB	Surian bawang	Cedrela serrata
125	SRW	Surian wangi	C. sureni

List C

Desirable Species

No.	Species Symbol	Vernacular Name	Botanical Name
126	BN	Bintangor (Jenis2 yang boleh menjadi besar sahaja)	Calophyllum spp.
127	BNBU	Bintangor batu	C. inophylloide
128	BNBT	Bintangor bukit	C. symingtonianum
129	BNBA	Bintangor bunga	C. curtisii
130	BNBN	Bintangor bunut	C. macrocarpum
131	BNDK	Bintangor daun karat	C. rubiginosum
132	BNDP	Bintangor daun panjang	C. incrassatum
133	BNGT	Bintangor gambut	C. retusum
134	BNGG	Bintangor gasing	C. pulcherrimum
135	BNGB	Bintangor gunong daun besar	C. coriaceum
136	BNGK	Bintangor gunong daun kechil	C. cuneatum
137	BNJG	Bintangor jangkang	C. sclerophyllum
138	BNKM	Bintangor kelim	C. scriblitifolium
139	BNKG	Bintangor kuning	C. floribundum
140	BNLT	Bintangor laut	C. inophyllum
141	BNLK	Bintangor lekok	C. depressinervosum
142	BNLN	Bintangor lilin	C. wallichianum
143	BNPH	Bintangor puteh	C. sp. No. 23
144	DH	Damar hitam	Shorea multiflora
145	DHB	Damar hitam bulu	S. resina-nigra

No.	Species Symbol	Vernacular Name	Botanical Name
146	DHG	Damar hitam gajah	S. gibbosa
147	DK	Damar katup	S. balanocarpoides
148	DS	Damar siput	S. faguetiana
149	DSJ	Damar siput jantan	S. hopeifolia
150	DR	Durian (melainkan D. tupai: Jenis yang boleh menjadi besar sahaja)	Durio spp. (melainkan D. griffithii)
151	DRP	Durian beludu	Durian oxyleyanus
152	DRD	Durian daun	D. lowianus
153	DRM	Durian merah	D. graveolens
154	GGL	Gegatal	Schima noronhas
155	KTS	(see SKP List D)	
156	KD	Kedondong (species normally growing to commercial timber size)	Burseraceae
157	KDBN	Kedondong bulan	Canarium littorale
158	KDGI	Kedondong gergaji	C. littorale f. rufum
159	KDKL	Kedondong kerantai lichin	Santiria laevigata
160	KDKB	Kedondong kerantai bulu	S. tomentosa
161	KDKT	Kedondong kerut	Dacryodes rostrata
162	KDKI	Kedondong kijai	Triomma malaccensis
163	KIMH	Kedondong matahari	Dacryodes rugosa
164	KIMS	Kedondong mempelas	D. laxa
165	KDSH	Kedondong senggeh	Canarium pseudosumatranum

No.	Species Symbol	Vernacular Name	Botanical Name
166	KDSG	Kedondong serong	Dacryodes puberula
167	KLG	Keledang	Artocarpus lanceifolius
168	KEMB	Kembang semangkok bulat	Scaphium linearicarpum
169	KEMJ	Kembang semangkok jantong	Scaphium macropodum
170	KPU	Krepal	Kostermansia malayana
171	MCH	Machang (M. api, M. Hutan)	Mangifera spp.
172	MU	Mata ulat	Kokoona spp.
173	MGL	Medang daun lebar	Litsea grandis
174	MGK	Medang Kemangi	Cinnamomum porrectum
175	MW	Merawan (jenis yang boleh menjadi besar sahaja)	Hopea spp.
176	MWB	Merawan batu	Hopea beccariana
177	MWG	Merawan bunga	H. pubescens
178	MWJ	Merawan jangkang	H. nervosa
179	MER	Merawan jeruai	H. sublanceolata
180	MWH	Merawan meranti	H. sulcata
181	MWP	Merawan penak	H. mengarawan
182	MWS	Merawan siput	H. sangal
183	MSJ	Merawan siput jantan	H. odorata
184	MHT	Merpauh daun tebal	Swintonia spicifera
185	MHP	Merpauh periang	S. schwenkii
186	NY	Nyatoh (jenis yang boleh menjadi besar sahaja)	Sapotaceae spp.

No.	Species Symbol	Vernacular Name	Botanical Name
187	NYDN	Nyatoh durian	Payena maingayi
188	NYJK	Nyatoh jambak	Palaquium hexandrum
189	NYKB	Nyatoh kabu	Palawuium xanthocuymum
190	NYKT	Nyatoh ketiau	Ganua motleyana
191	NYNK	Nyatoh nangka kuning	Pouteria malaccensis
192	NYPT	Nyatoh pipit	Palaquium microphyllum
193	NYPH	Nyatoh puteh	P. obovatum
194	NYSM	Nyatoh semaram	P. semaram
195	NYSG	Nyatoh sidang	P. rostratum
196	NYSK	Nyatoh sundek	Payena obscura
197	NYTA	Nyatoh tembaga	Palaquium maingayi
198	NYTK	Nyatoh tembaga kuning	P. hispidum
199	PD	Pudu	Artocarpus spp.
200	PLB	Pelong beludu	Pentaspadon velutinus
201	PLL	Pelong lichin	P. officinalis
202	PTM	Petai meranti	Parkia singularis
203	PUG	Punggai	Coelostegia griffithii
204	SPM	Sepam (see MCH List C)	
205	SPT	Sepetir	Sindora spp.
206	SPB	Sepetir beludu	S. velutina
207	SPDN	Sepetir daun nipis	S. echinocalyx
208	SPDT	Sepetir daun tebal	S. wallichii
209	SPLN	Sepetir lichin	S. coriacea

No.	Species Symbol	Vernacular Name	Botanical Name
210	SSK	Sesendok	Endospermum malaccensis
211	SM	Simpoh (jenis yang boleh menjadi besar sahaja)	Dillenia spp.
212	SMB	Simpoh beledu	D. ovata
213	SMM	Simpoh daun merah	D. grandifolia (syn. D. eximia)
214	SMG	Simpoh gajah	D. reticulata
215	SMD	Simpoh padang	D. obovata
216	SMP	Simpoh paya	D. pulchella
217	TPG	Tampang	Artocarpus spp.
218	TK	Tempunek	A. rigidus
219	TR	Terentang	Campnosperma spp.
220	TRB	Terentang daun besar	C. auriculata
221	TRK	Terentang daun kechil	C. montana
222	TRS	Terentang simpoh	C. coriacea
223	TLG	Tualang	Koompassia excelsa

List D

Acceptable Species

No.	Species Symbol	Vernacular Name	Botanical Name
224	ABB	Ara berteh bukit	Parartocarpus bracteatus
225	ABP	Ara berteh paya	Parartocarpus venenosus
226	BKK	Bekak	Amoora spp.
227	BA	Bangkong	Artocarpus integer
228	BG	Bengang (Dendulang)	Neesia spp.
229	CH	Chempedak	Artocarpus kemando
230	CHA	Chempedak ayer	Artocarpus maingayi
231	DDI	Dedali	Strombosia javanica
232	JKB	Jangkang bukit	Xylopia ferruginea
233	JKP	Jangkang paya	K. fusca
234	JW	Jelawai	Terminalia spp.
235	JWJ	Jelawai Jaha	T. subspathulata
236	JKW	Jelawi Ketapang	T. catappa
237	JWB	Jelawi mempelan babi	T. phellocarpa
238	JWN	Jelawai mentalun	T. calamansanai (Syn. T. pyrifolia)
239	KMP	Kamap	Strombosia javanica
240	KR	Karas (gaharu)	Aquilaria malaccensis
241	KS	Kasai	Pometia spp.
242	KBS	Kasai daun besar	P. pinnata
243	KSK	Kasai daun kechil	P. alnifolia
244	KSL	Kasai daun lichin	P. ridleyi

No.	Species Symbol	Vernacular Name	Botanical Name
245	KKH	Kekabu hutan	Bombax valetonii (Syn. Salmalia valetonii)
246	KT	Kelat (jenis yang boleh menjadi besar sahaja)	Eugenia spp.
247	KLM	Kelempayan	Anthocephalus cadamba
248	KGH	Kenanga hutan	Cananga odorata
249		Kulim	Scorodocarpus borneensis
250	KNG	Kundang	Bouea spp.
251	KUG	Kungkur	Pithecellobium splendens
252		Ludai	Sapium baccatum
253	MHG	Mahang	Macaranga spp.
254	MBR	Malaberra	Fagraea crenulata
255	MNN	Mangitan	Platymitra siamensis
256	MKB	Mata kuching beludu	Hopea myrtifolia
257	MG	Medang	Alseodaphne spp.
258	MG	Medang	Beilschmiedia spp.
259	MG	Medang	Dehaasia spp.
260	MG	Medang	Litsea spp.
261	MG	Medang	Nothaphoebe spp.
262	MG	Medang	Phoebe spp.
263	MLU	Melembu	Pterocymbium javanicum
264	MPG	Mempening	Quercus and Lithocarpus spp.

No.	Species Symbol	Vernacular Name	Botanical Name
265		Mempisang (jenis yang boleh menjadi besar sahaja)	Alphonsea, Monocarpia, Mezzettia, Polyalthia and some Xylopia spp.
266	MND	Mendong (jenis boleh menjadi besar sahaja)	Elaeocarpus spp.
267	MSH	Mensirah (jenis yang boleh menjadi besar sahaja)	Ilex spp.
268	MTS	Mertas	Ctenolophon parvifolius
269	MYB	Minyak berok (jenis yang boleh menjadi besar sahaja)	Xanthophyllum spp.
270	OTU	otak udang	Buchanania spp.
271	PSK	Pasak (jenis yang boleh menjadi besar sahaja)	Aglaia spp.
272		Penarahan	Myristicaceae
273	PNA	Penarahan arang	Myristica spp.
274	PPH	Pepauh (jenis yang boleh menjadi besar sahaja)	Evodia spp.
275	PRH	Perah	Elateriospermum tapos
276	PRK	Perupok	Lophopetalum spp.
277	PT	Petai	Parkia speciosa
278	PTK	Petai kerayong	P. javanica
279	PTG	Petaling	Ochanostachys amentacea
280	PUL	Pulai	Alstonia spp.
281	PUB	Pulai basong	A. spathulata

No.	Species Symbol	Vernacular Name	Botanical Name
282	PUT	Putat (jenis yang boleh menjadi besar sahaja)	Barringtonia and chydenanthus spp.
283	SAG	Saga	Adenanthera spp. Ormosia spp.
284	SKP (KTS)	Samak pulut	Cordonia concentricicatrix
285	SKG	Sengkuang	Dracontomelon maingiferum
286	STL	Sentul	Sandoricum koetjape
287	SL	Sepul	Parishia spp.
288	TAM	Taban merah	Palaquium gutta
289	TAP	Taban puteh	P. oxleyanum
290	TRP	Terap hitam	Artocarpus scortechinii

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